REMARKS

Claims 5, 26, and 47 have been cancelled, new claims 65, 66, 67 have been added; thus, claims 1-4, 6-25, 27-46, and 48-67 are all the claims presently pending in the application. Claims 1-64 stand rejected on prior art grounds. Claims 1, 22 and 43 stand rejected under 35 U.S.C. 101 because of the limitations "can be" in lines 7 and 8 of the claims, and also the claimed invention is directed to non-statutory subject matter. Claims 1, 22, and 43 stand rejected upon informalities under 35 U.S.C. 112, second paragraph. Claims 1-64 stand rejected under 35 U.S.C. 103(a). Applicants respectfully traverse these rejections based on the following discussion.

I.   **The Claim Objections**

The Office Action asserts that "claims 1, 10, 13, 16, 22, 31, 34, 37, 43, 52, 55, and 58 recite the word 'for' in the body of the claims. It indicates intended use and as such does not carry any patentable weight. The word could be changed to recite 'to'" (Office Action, p. 2, item 3). Accordingly, Applicants have amended claims 1, 10, 13, 16, 22, 31, 34, 37, 43, 52, 55, 58, and 64 to replace the word "for" with "to" or "to perform".

Further, the Office Action asserts that the recitation of the limitation "can be" in claims 1, 22, and 43 "makes the claim limitation optional" (Office Action, p. 2, item 3). As such, Applicants have amended independent claims 1, 22, 43, and 64 to replace "can be" with "are". In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw the objections to the claims.

II.   The 35 USC § 101 Rejections

Claims 1, 22 and 43 stand rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The Examiner asserts that the claims are drawn to non-statutory subject matter because hardware is not directly recited to the steps in the claimed method.

Applicant's respectfully disagree with the Examiner. The Examiner's attention is directed to *Ex Parte Lundgren* Paper No.78 (BPAI 2004) which directly addresses this question. The Board of Patent Appeals and Interferences in *Ex Parte* Lundgren, citing the decision of the *Federal Circuit in AT&T Corp. v. Excel Communications, Inc.*, 172 F.3d 1352, 1358, 50 USPQ2d 1447, 1452 (Fed. Cir. 1999), states that "a process claim that applies a mathematical algorithm to 'produce a useful, concrete, tangible result without pre-empting other uses of the mathematical principle, on its face comfortably falls within the scope of §101'". Since the method claims produce a "useful, concrete, tangible result," the claims meet the standards under 35 U.S.C. §101, and the rejection should be withdrawn.

Moreover, Applicants submit that independent claims 1, 22, 43, and 64 to define reporting the user query result to the user, which produces a "useful, concrete, tangible result".

III.   The 35 USC § 112 Rejections

The Office Action asserts that "[c]laims 1, 22, and 43 recite computation for 'index selection or materialized view' yet the end of the limitation states that the determination is based on 'said index'. The materialized view is ignored in the recitation therefore is not needed in the 'or' statement" (Office Action, p. 3, item 7). Accordingly, Applicants have amended

independent claims 1, 22, 43, and 64 to define index selection and materialized view matching to determine what portion of said query expressions are evaluated by said index and said materialized view. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw this rejection.

IV.   The Prior Art Rejections

Claims 1-64 stand rejected under 35 U.S.C. §103(a) as being obvious over Barton et al. (U.S. Patent Publication No. 2004/0068487), hereinafter referred to as "Barton" in view of Yalamanchi et al. (U.S. Patent Publication No. 2003/0212670), hereinafter "Yalamanchi". Applicants respectfully traverse these rejections based on the following discussion.

The claimed invention provides a method for using pre-computed information stored in auxiliary structures to speed up processing of expensive queries on hierarchical documents such as XML documents being queried using XPath. The invention defines a taxonomy of such structures such as indexes and materialized views for storing pre-computed XPath results (PXRs), determines what portion of the query can be evaluated by the structures, and computes the compensation for the results generated by the structures. In the rejection, the Office Action argues that Yalamanchi teaches many features defined by the claimed invention. However, nothing within Yalamanchi teaches or suggests computing compensation to perform index selection and materialized view matching to determine what portion of the query expressions are evaluated by the index and the materialized view. Instead, Yalamanchi merely discloses an "index mechanism" to evaluate large sets of "expressions", which are event or content-based

states that trigger an action. Therefore, as explained in greater detail below, Applicants

respectfully submit that the prior art of record does not teach or suggest the claimed invention.

The Office Action argues that "Yalamanchi teaches computing compensation for index

selection or materialized view matching to determine what portion of said query expressions can

be evaluated by said index" (Office Action, p. 5, para. 3; p. 11, para. 1). Such features are

defined in independent claims 1, 22, 43, and 64 using similar language.

As to these claims, the Examiner, in support of the rejections of these claims, refers to

paragraph 0054 of Yalamanchi. However, nothing within Yalamanchi, including the portions

cited by the Examiner, teaches or suggests computing compensation to perform index selection

and materialized view matching to determine what portion of the query expressions are

evaluated by the index and the materialized view.

To the contrary, as discussed in paragraphs 0016 and 0017 of Applicants' disclosure, the

invention speeds up the processing of potentially expensive queries on hierarchical documents by

using pre-computed information stored in auxiliary structures. The hierarchical documents are

typically XML documents being queried using XQuery or SQL/XML query languages. The

auxiliary structures may include materialized views and indexes, and the pre-computed

information may include XPath expression results. The invention defines a taxonomy of

structures for storing pre-computed XPath results (PXRs). The invention determines what

portion of the query can be evaluated by the index or materialized view and computes the

compensation for the index or materialized view, which defines how the pre-computed results

can be exploited to compute the whole query result.

Thus, given an XPath index definition and a query containing XPath expressions, the

invention identifies the portion of the query that can be answered by the index, as well as the

XPath expression needed to compute the query result. Similarly, given a materialized XML view

definition containing XPath expressions and a user query, the invention determines if the view

can be used to answer the query, and computes the compensation and rewrites the query

accordingly.

     As further discussed in paragraph 0018 of Applicants' disclosure, the invention

represents the XPath expression as a tree of XPath steps, where each of the XPath steps

comprises an XPath step node having axis data, test data, predicate data, and next XPath step

node data. The invention identifies the matching indexes or materialized views by detecting

containment mappings between XPath expressions in the query and the index or materialized

view. Containment mapping detection comprises traversing the tree of XPath steps (typically

from the top down) and, during the traversing, matching axis data, test data, predicate data, and

next XPath step node data with index or materialized view XPath expressions. For each such

match identified, the invention computes an XPath expression to be applied to the index or

materialized view, as well a compensation XPath expression to be applied as a residual query.

     Nothing within Yalamanchi teaches or suggests computing compensation to perform

index selection and materialized view matching to determine what portion of the query

expressions are evaluated by the index and the materialized view. Instead, Yalamanchi merely

discloses an "index mechanism" to evaluate large sets of "expressions", which are event or

content-based states that trigger an action.

     More specifically, as described in paragraph 0003 of Yalamanchi, in the context of event

and content-based subscription systems, events are defined which, when met, trigger an action.

For example, a subscriber can define rules that include events that define a state of content that, when met, trigger transmission of content to the subscriber. Using a database management system as an underlying engine for an event-based subscription system, a subscriber can register queries with the system that represent conditional expressions on the content of the events. In such a subscription or similarly functioning system, a potentially very large set of queries, i.e., an expression set on the content, are registered to manage the publication of desired content data. When a given data item becomes available, these conditional expressions are filtered to find those expressions that match the given data item.

Furthermore, as described in paragraph 0054 of Yalamanchi, when a large set of expressions are defined, this approach is not scalable for a high volume of data items. Therefore, in an embodiment, a new indexing mechanism is used to evaluate a large set of expressions efficiently and, consequently, to quicken the evaluation of the expression set for a given data item or data string. This index can be defined on an EXPRESSION column, thus a query optimizer can determine the use of the index for the evaluation of an expression set, based on the index usage cost. In an implementation, persistent database objects are created to maintain the index for an expression set, where pre-processing the expressions set at the time of index creation populates these database objects. Additionally, the information stored in these objects is maintained to reflect any changes to the expression set using DML operations on the table storing the expressions.

However, nothing within Yalamanchi teaches determining what portion of expression sets can be evaluated by said index and said materialized view by computing compensation to perform index selection and materialized view matching. Instead, Yalamanchi merely discloses

that an index mechanism can be used to evaluate large sets of expressions. Therefore, it is

Applicants' position that contrary to the position taken in the Office Action, Yalamanchi fails to

teach or suggest the claimed features of "computing compensation to perform index selection

and materialized view matching to determine what portion of said query expressions are

evaluated by said index and said materialized view" as defined in independent claims 1, 22, 43,

and 64.

Therefore, it is Applicants' position that the proposed combination of Barton and

Yalamanchi does not teach or suggest many features defined by independent claims 1, 22, 43, 64

and that such claims are patentable over the prior art of record. Further, it is Applicants' position

that dependent claims 2-4, 6-21, 23-25, 27-42, 44-46, 48-63, and 65-67 are similarly patentable,

not only because of their dependency from a patentable independent claims, but also because of

the additional features of the invention they defined. In view of the foregoing, the Examiner is

respectfully requested to reconsider and withdraw the rejections.

V.   **Formal Matters and Conclusion**

In view of the foregoing, Applicants submit that claims 1-4, 6-25, 27-46, and 48-67, all

the claims presently pending in the application, are patentably distinct from the prior art of

record and are in condition for allowance. The Examiner is respectfully requested to pass the

above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the

Examiner is requested to contact the undersigned at the local telephone number listed below to

discuss any other changes deemed necessary.

Please charge any deficiencies and credit any overpayments to Attorney's Deposit

Account Number 09-0441.

Respectfully submitted,

Dated: 3/28/07   /Duane N. Moore/

                                             Duane N. Moore, Esq.
                                             Registration No. 53,352

Gibb & Rahman, LLC
2568-A Riva Road, Suite 304
Annapolis, MD 21401
Voice: 301-261-8071
Fax: (301) 261-8825
Customer Number: 29154